A european-wide study on the role of streptococcus pneumoniae in community-acquired pneumonia among adults: A meta-analysis

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were clearly judged favourable or unfavourable. In decisions where the evidence was rated uncertain or was not assessed, we found that the number of stakeholders participating in the voting stage (odds ratio=2.52; p=0.03) and the scientific rigour in assessment of costs/cost-effectiveness (OR=6.25; p=0.06) increased the likelihood of a positive decision outcome. On the contrary, it significantly decreased for prescribed medicines (OR=0.05; p=0.003). **CONCLUSIONS:** Despite claims for making transparent and participative coverage decisions, the phase of evidence generation and synthesis is most critical for technology appraisal. Decison makers usually adapt the assessment recommendations. Decision outcomes seem to a large extent independent of how processes are configured.

PODIUM SESSION III: VACCINE RESEARCH

VA1

A EUROPEAN-WIDE STUDY ON THE ROLE OF STREPTOCOCCUS PNEUMONIAE IN COMMUNITY-ACQUIRED PNEUMONIA AMONG ADULTS: A META-ANALYSIS

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OBJECTIVES: Community-acquired pneumococcal pneumonia is an important cause of hospitalization and death among adults, but figures on the prevalence of *Streptococcus pneumoniae* largely vary. We aimed to identify the prevalence of *Streptococcus pneumoniae* by systematically reviewing all available etiological studies of adult patients with community-acquired pneumonia (CAP) over the period January 1990- November 2011 across European countries. **METHODS:** Two reviewers conducted a systematic literature search using PubMed of English-language articles on the prevalence of adult CAP caused by *S. Pneumoniae* and manually reviewed the article bibliographies. A mixed-effects meta-regression model was developed and populated with 24,236 patients obtained from 79 articles that met in- and exclusion criteria. The meta-regression was adjusted for country and region characteristics as well as other possible independent covariates. **RESULTS:** The findings from the mixed-effects meta-regression model indicate that the observed prevalence of *S. pneumoniae* in CAP significantly differs between European regions even after adjusting for various covariates including patient characteristics, diagnostic tests, antibiotic resistance and health-care setting. Performing a diagnostic PCR assay increased the probability of detecting *S. pneumoniae* substantially, compared to all other diagnostic tests included. Furthermore, *S. pneumoniae* was more likely to be confirmed as the cause of a CAP in cases treated in the ICU as compared to those treated in the hospital or in the community. **CONCLUSIONS:** This study provides estimates of the prevalence of S. Pneumoniae in CAP, independent of study design, or other risk factors, which could be used for predictions of the health and economic impact of adult pneumococcal vaccination.

VA2

CORRELATES OF PROTECTION FOR VACCINES: WHEN DOES A CORRELATE EQUAL PROTECTION?

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OBJECTIVE: A fundamental information needed to conduct economic evaluations of vaccines is effectiveness against disease. However, effectiveness is not always observed directly and relies on an immunological response that predicts protection. Typical immune responses which are predictive of protection are neutralizing antibodies, called surrogates or correlates of protection (COP). Often the COP is reduced to a threshold value that differentiates between protected and susceptible. COPs are relied on in place of estimates of effectiveness and for immunization policy, however there are no consistent criteria or statistical methods for establishing candidate immune response as predictive COP. Our aims were to review proposed hierarchies of evidence necessary to establish a COP and statistical methods used to relate immune responses to protection. **METHODS:** The strength of evidence for demonstrating a COP based on different frameworks and early and modern statistical methods approaches to establish a COP were reviewed. Findings and Recommendations: Different frameworks define different levels of confidence in COPs. The Prentice framework is significance testing-driven and requires protection to be related to vaccination, the correlate related to the vaccine and correlate related to clinical endpoint. Moreover vaccination should not add additional information on protection over that explained by the correlate. A framework by Qin proposes levels of evidence based on single or multiple randomized trials. To estimate thresholds, early vaccine studies relied on inspection of disease rates observed in discrete intervals of assay values. Modern examples employed Chang-Kohberger method, but this requires an estimate of vaccine efficacy based on occurrence of disease before it can be used. The scaled-logit model permits estimation of continuous protection curves by antibody titer. In addition to statistical criteria, other considerations include clear endpoint definition, laboratory assays, host and population factors. New statistical methods should be developed and tested within evidence frameworks to better obtain estimates of vaccine effectiveness.

VA3

HOW AGENT-BASED MODELS REVEAL THE DYNAMIC OF EPIDEMICS – A CASE STUDY ON INFLUENZA

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OBJECTIVES: Influenza is a disease that occurs every year for a few months in winter season. Predictions on vaccination strategies require a deep understanding of current influenza epidemics. The aim of this work is the reproduction of a past influenza season through a model, its examination and to make its dynamics transparent. **METHODS:** We used an agent based epidemic model to simulate the spread of influenza. It belongs to the class of dynamic transmission models and simulates single persons with individual behavior who live in an environment, meet each other and spread the virus from person to person upon contacts. Contacts are based on statistical data and social studies; epidemiological parameters are found in clinical studies and through calibration. **RESULTS:** Estimates say that about 5% of the population fall sick with influenza every year in Austria. The model shows clearly that this number is highly implausible under naive assumptions because the epidemic would not behave like this; instead it would be much stronger or die out – depending on the parameters. This reveals that our knowledge on influenza is insufficient. Three additional assumptions might solve the problem: First, that the influenza season highly depends on the seasonal climate, second, that many people are generally resistant for the whole season and third, that many people undergo infections without symptoms. Simulation of these assumptions reveal three different possible propagations of the influenza that all result in 5% sick people. **CONCLUSIONS:** The model cannot answer all questions about influenza. But it is able to show clearly where we need more information and it provides the possibility to test different assumptions and evaluate them. In other words, the model can lead to a deeper understanding of the real world by examining assumptions that could not be observed directly so far.

VA4

FOUND THE MISSING LINK? HOW TO RELATE COHORT MODELS TO OBSERVED POPULATION DATA

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OBJECTVES: Pre-launch economic models are constructed to simulate long-term changes in costs and effects. Typically Markov cohort models are used, whereas the input often available to parameterize the models is obtained from cross-sectional, annual, population data. The question is how to make the link and reconcile results from long-term cohort models with annual observed population data? An illustration is given with modelled and observed hospitalisations due to rotavirus related acute gastroenteritis. **METHODS:** The spread of hospitalisations of children up to the age of 5 years, observed over a one -year period follows a normal distribution (seasonality of the infection) with a peak around February March each year. The assessment is done by 1-year age-groups (0 to 1y; 1 to 2y; 2 to 3y; 3 to 4y; 4 to 5y). The parameters of this normal distribution are used to construct an overall modelled population density curve with the same annual spread. Within this construction the weekly spread of hospitalisations by age follows the density curve of the cohort model with an age-specific Weibull distribution. To compare the model results with the observation we analyse the age-group spread of hospitalisations but also the results following the introduction of a specific intervention such as vaccination. **RESULTS:** Pre-vaccination, the fit of the age-related spread of hospitalisations modelled using the population model to the observed data was compelling (regression-scale model fit < 0.05). Post-vaccination the modelled and observed reduction in hospitalisations matched, however in the unvaccinated older children the model predicted a lower reduction than observed which could be explained by a herd protection effect in the observed population (indirect vaccine benefit). Herd protection was not captured in the static model. **CONCLUSIONS:** It is possible to make the link between cohort models and observed population data provided the underlying model characteristics reflect reality.

RESEARCH POSTER PRESENTATIONS – SESSION I HEALTH CARE USE & POLICY STUDIES

HEALTH CARE USE & POLICY STUDIES - Consumer Role In Health Care

PHP1

INCORPORATING THE PATIENT'S VOICE INTO THE ASSESSMENT OF MEDICAL DEVICES: A COMPARISON OF THE UNITED STATES AND EUROPE

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OBJECTIVES: Medical devices (MDs) play a major role in many aspects of health care. The United States (US) and Europe (EU) categorise MDs into different classes, with greatest regulatory control imposed on the highest risk Class III devices. In the US, the Food and Drug Administration (FDA) approves Class-III MDs. In EU, the European Commission sets the regulatory framework through which 'notified bodies' confer a Confomité Européene (CE) mark for MDs. The purpose of this study was to evaluate the extent to which patient-reported outcomes (PROs) are considered in the assessment of Class-III MDs in the US and EU. **METHODS:** The Drug Approval Packages of MDs granted approval by the FDA from 2006-2011 were reviewed to identify MDs presenting PRO-related data. Ophthalmology MDs were reviewed in greater detail to explore the range of PRO constructs presented. No publically available database of EU MD approvals exists, making a parallel search impossible. Instead, clinical trial databases (e.g. ClinicalTrials.gov) were searched to identify EU-registered trials with PRO-endpoints for the ophthalmology MDs identified from the US FDA review. **RESULTS:** The FDA approved 197 MDs from 2006-2011, of which 52(26.4%) presented PRO data. PRO-claims were lowest in 2008